

# Spear Road Ravine Design/Build Report

Whitley County, Indiana

September 28, 2004



Prepared for:

Crooked Lake Association, Inc.  
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## **SPEAR ROAD RAVINE DESIGN/BUILD REPORT EXECUTIVE SUMMARY**

This project addresses erosion that was occurring within a small ravine adjacent to Spear Road near Crooked Lake in Whitley County, Indiana. The primary goal of this project was to reduce the erosion and delivery of associated sediment from the ravine to Crooked Lake. This was accomplished by installing a series of three rock check dams within the ravine on the tributary. This project was made possible in part by the cooperation of the adjacent landowner to the project site and the Crooked Lake Property Owners Association and with funding from the Indiana Department of Natural Resources' Lake and River Enhancement (LARE) Program.

## TABLE OF CONTENTS

	Page
1.0 PROJECT DESCRIPTION AND PURPOSE .....	1
2.0 DESIGN RATIONALE .....	1
3.0 DESIGN AND CONSTRUCTION SPECIFICS .....	2
3.1 Permitting.....	2
3.2 Landowner Agreements .....	2
3.3 Check Dams .....	2
3.4 Erosion Control Blankets.....	3
4.0 CONSTRUCTION SCHEDULE.....	3
5.0 MONITORING AND MAINTENANCE ACTIVITY .....	3
6.0 PROJECT SUMMARY .....	3

## TABLE OF FIGURES

Figure 1. Approximate project site location .....	1
Figure 2. Typical non-woven geotextile erosion control blanket placement.....	2
Figure 3. Typical erosion control blanket placement and check dam.....	3

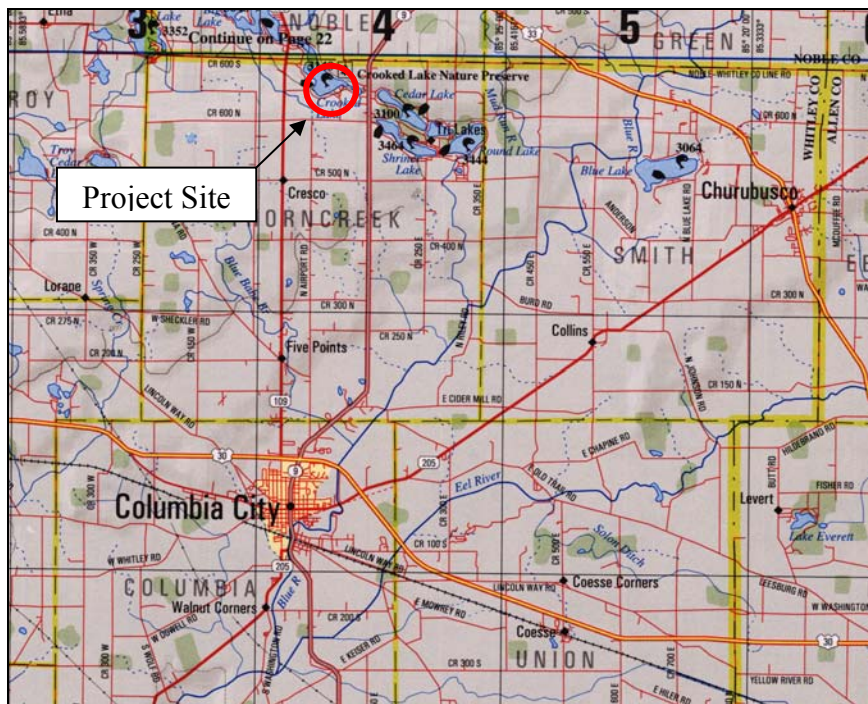
## APPENDICES

### APPENDIX A. SITE PLAN AND DESIGN DETAILS

# **SPEAR ROAD RAVINE DESIGN/BUILD REPORT WHITLEY COUNTY, INDIANA**

## **1.0 PROJECT DESCRIPTION AND PURPOSE**

The project site is small ravine, which is located next to Spear Road near the south end of Crooked Lake. Crooked Lake is located approximately six miles north of Columbia City in Whitley County, Indiana (Figure 1). During storm events, the ravine carries water to Crooked Lake. This project involved reducing erosion that was occurring within the small ravine as a result of the storm flows. Eroded materials from the small ravine were being deposited into Crooked Lake during high precipitation/ runoff events. A series of rock check dams were installed in the ravine to reduce erosion. The purpose of this project was to stabilize the small ravine and thereby reduce the delivery of sediment and associated nutrients to Crooked Lake.



**Figure 1. Approximate project site location.**

## **2.0 DESIGN RATIONALE**

This project was designed to stabilize the small ravine located near the southern end of Crooked Lake. A field survey conducted by JFNew on January 15, 2004 showed that the ravine fell approximately ten feet in elevation over a 350-foot reach near its outlet to Crooked Lake. A number of “nick points” were evident on the profile view of the ravine indicating that the storm flow channel in the ravine was downcutting. To prevent further downcutting, rock grade controls or check dams were considered as viable options. Since no fish were present along the project reach, a structure that allowed fish passage (grade controls) was not needed. The check dams would cause water to pool behind the dams and reduce the velocity of water moving through the channel. Over time, sediment would be deposited in the pooled areas and reduce the



streams gradient along the “nick points”. This, in turn, would reduce the erosion that was occurring in the ravine.

The design and placement of the check dams also had to account for the potential of landowner flooding. For this reason, the check dams were placed in the upstream reach of the ravine near Stations F, H, and K and incorporated low peak elevations. Each check dam is no higher than 1.5 feet above the existing storm flow channel bottom elevation (Appendix A).

### **3.0 DESIGN AND CONSTRUCTION SPECIFICS**

#### **3.1 Permitting**

No permits were required from the U.S. Army Corps of Engineers, Indiana Department of Environmental Management, Indiana Department of Natural Resources, or Whitley County Drainage Board.

#### **3.2 Landowner Agreements**

This project occurred on three separate properties. Permission was granted from each landowner before accessing their respective property. Agreements were signed by each landowner granting access for construction, inspection, and maintenance of the check dams. Landowner agreements are located in the Crooked Lake project file at JFNew’s corporate headquarters in Walkerton, Indiana.

#### **3.2 Check Dams**

A series of three check dams was installed within the small ravine. Check dams were constructed by excavating a key trench three feet into each storm flow channel bank and two feet into the channel bed. The bottom and sides of each key trench were then lined with a non-woven geotextile fabric (Figure 2). The key trench was then filled with fieldstone to the appropriate elevation according to the plans. Fieldstone, measuring at least six inches in diameter, was graded to a 3:1 slope on both the upstream and downstream face (Figure 3). Site plans, stream cross-sections, and check dam details can be found in can be found in Appendix A.



**Figure 2. Typical non-woven geotextile erosion control blanket placement.**

### 3.4 Erosion Control Blankets

Ravine slopes disturbed by check dam construction were seeded with Virginia wild rye (*Elymus virginicus*) and then covered with a biodegradable erosion control blanket (North American Green SC-150 BN). The erosion control blanket was secured with 6-inch metal sod staples on 1.5 foot centers. Figure 3 shows typical erosion control blanket placement within the ravine.



**Figure 3. Typical erosion control blanket placement and check dam.**

### 4.0 CONSTRUCTION SCHEDULE

JFNew engineers approved the project design plans on July 29, 2004. JFNew met with Jack Owen Excavating from Albion, Indiana during the first week of August to discuss the site plans and construction. Construction began and concluded in August of 2004.

### 5.0 MONITORING AND MAINTENANCE ACTIVITY

A landowner or Crooked Lake Property Owners Association member should monitor the project site on an annual basis for the next three to five years. The project site should be inspected following heavy rain events to ensure that: (1) the storm flow channel has not cut a new channel around the check dams; and (2) that the check dams have not been completely washed out. Additionally, the slopes that were disturbed during construction should be periodically inspected for erosion control blanket tears or gully formation under the blankets. If any of these situations are noted during the inspection, action should be taken by the Crooked Lake Property Owners Association to resolve the situation in a timely manor.

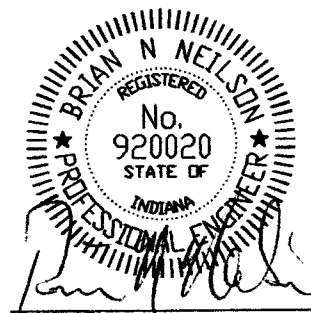
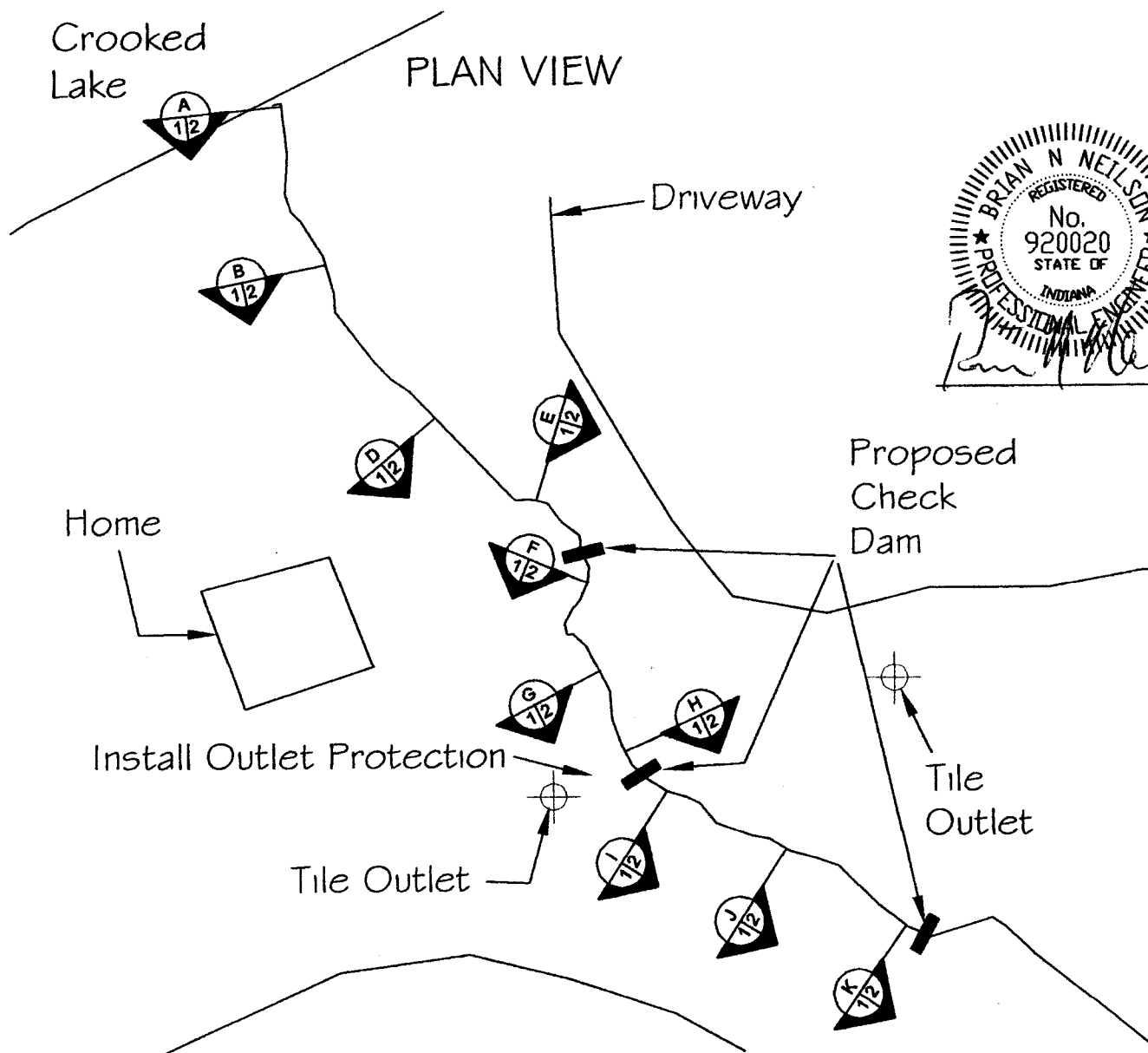
### 6.0 PROJECT SUMMARY

The overall purpose of this project was to reduce erosion that was occurring in a ravine near Crooked Lake. This was accomplished by installing a series of three check dams within the ravine, thereby reducing the delivery of sediment and associated nutrients to Crooked Lake.

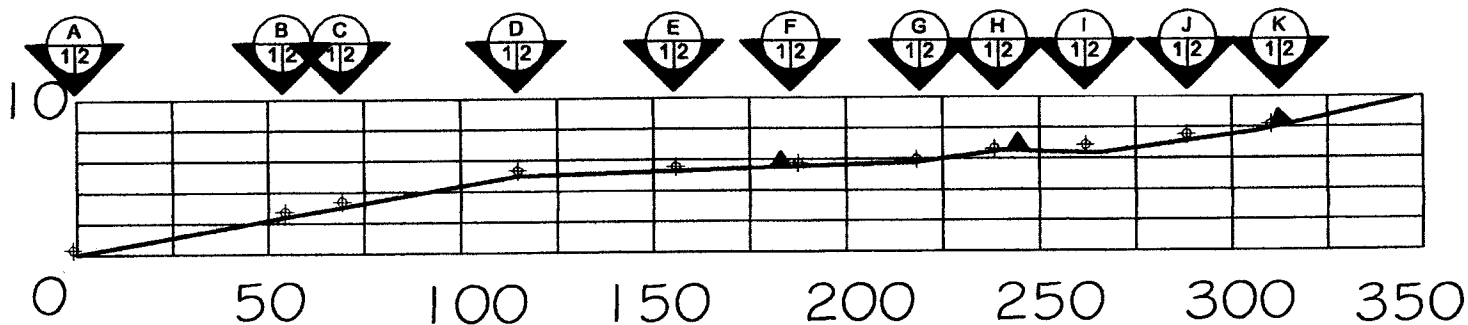
**APPENDIX A**  
**SITE PLANS AND DESIGN DETAILS**

Crooked Lake

# PLAN VIEW



# PROFILE VIEW



**JFNew**

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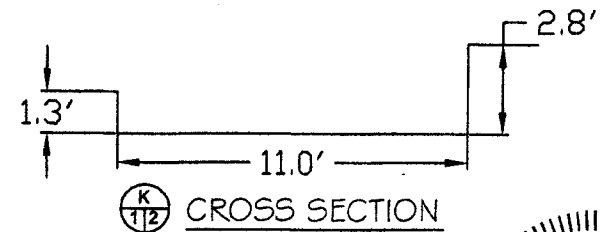
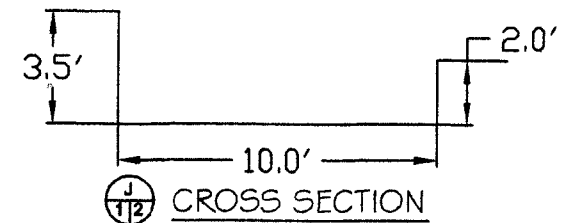
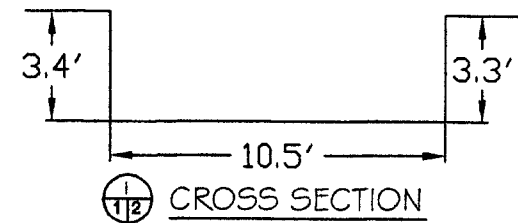
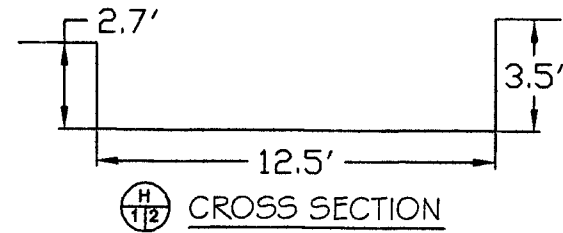
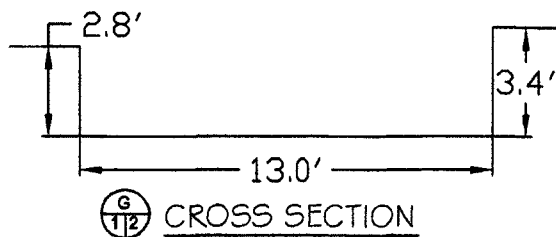
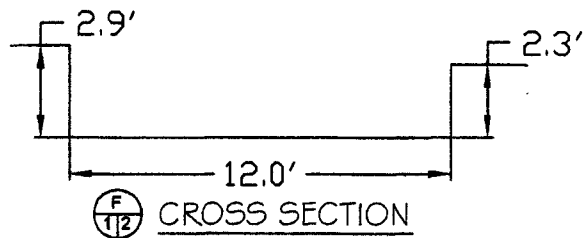
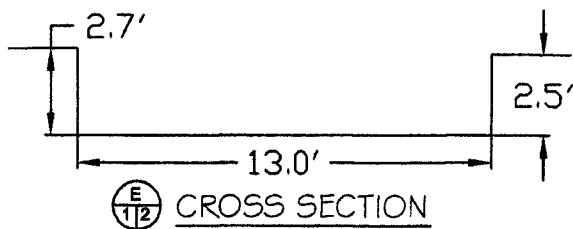
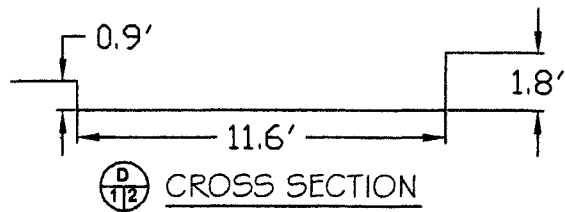
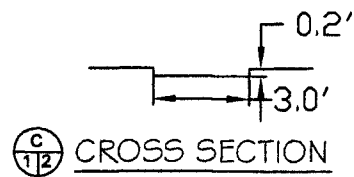
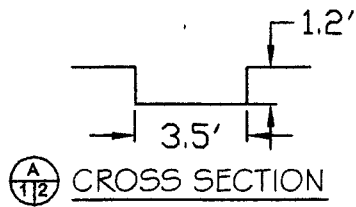
CROOKED LAKE ASSOCIATION, INC  
T32N, R9E, SECTION 3  
THORNCREEK TOWNSHIP  
WHITLEY COUNTY, INDIANA

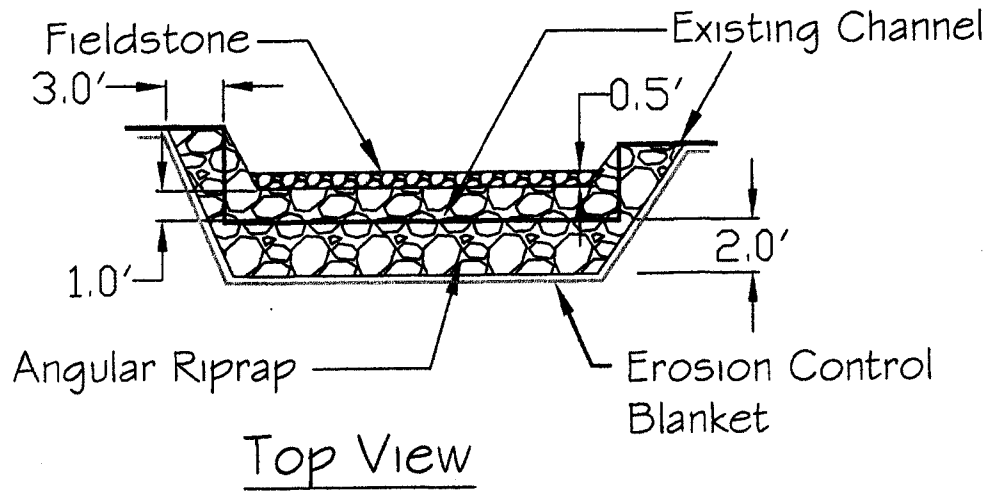


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PROPOSED SITE PLAN

SHEET 1 OF 3

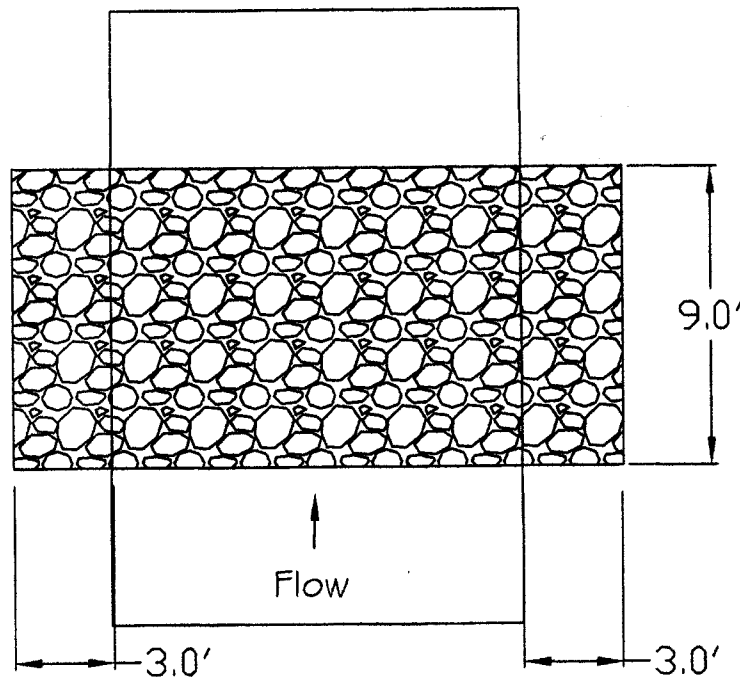






**Notes:**

1. Angular riprap will be keyed 3' into each bank and 2' into the bed.
2. Fieldstone used for the cap will have a minimum diameter of 6".
3. The final slope of the upstream and downstream faces will be 3:1.
4. Erosion control blanket shall be placed in the bottom of the key trench prior to riprap placement.



Typical Check Dam Design

